EXHIBIT B

HEWLETT-PACKARD COMPANY
Intellectual Property Administratio.
P. O. Box 272400
Fot Collins, Colorado 80527-2400

PATENT APPLICATION

ATTORNEY DOCKET NO. __10003407-1__

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): HAO et al.

Application N .: 09/847,390

Filing Date: May 2, 2001

Title: Method and System for Web-Based Visualization of Directed Association and Frequent Item Sets in Large Volumes of Transaction Data

Confirmation No.: 6484

Examiner: Channavajjala

Group Art Unit: 2177

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL LETTER FOR RESPONSE/AMENDMENT

Sir:

Transmitted herewith is/are the following in the above-identified application:

(X) Response/Amendment   ( ) Petition to extend time to respond
(X) New fee as calculated below   ( ) Supplemental Declaration
( ) No additional fee   (Address envelope to "Mail Stop Non-Fee Amendment")
( ) Other: _____ (fee $_____)

(1). FOR	(2) CLAIMS REMAINING AFTER AMENDMENT	(3) NUMBER EXTRA	(4) HIGHEST NUMBER PREVIOUSLY PAID FOR	(5) PRESENT EXTRA	(6) RATE	(7) ADDITIONAL FEES
CLAIMS AS AMENDED BY OTHER THAN A SMALL ENTITY						
TOTAL CLAIMS	33	MINUS	33	= 0	X $18	$ 0
INDEP. CLAIMS	4	MINUS	4	= 0	X $86	$ 0
[ ] FIRST PRESENTATION OF A MULTIPLE DEPENDENT CLAIM					+ $290	$ 0
EXTENSION FEE	1ST MONTH $110.00	2ND MONTH $420.00	3RD MONTH $950.00	4TH MONTH $1480.00		$ 0
				OTHER FEES		$
			TOTAL ADDITIONAL FEE FOR THIS AMENDMENT			$ 0

Charge $___0___ to Deposit Account 08-2025. At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450.

Date of Deposit: March 1, 2004

Typed Name: Trac y M. Dotter

Signature:

Respectfully submitted,

HAO et al.

By

LeRoy D. Maunu

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Date: March 1, 2004

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Rev 10/03 (TransAmd)

- Attach as First Page to Transmitted Papers -

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Hao et al.	Examiner:	Channavajjala
Serial No.:	09/847,390	Group Art Unit:	2177
Filed:	May 2, 2001	Docket No.:	10003407-1 (HPCO.140PA)
Title:	METHOD AND SYSTEM FOR WEB-BASED VISUALIZATION OF DIRECTED ASSOCIATION AND FREQUENT ITEM SETS IN LARGE VOLUMES OF TRANSACTION DATA		

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence and the papers, as described hereinabove, are being deposited in the United States Postal Service, as first class mail, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on March 1, 2004.

By: _Tracey M. Dotter_
Tracey M. Dotter

AMENDMENT AND RESPONSE AFTER
FINAL REJECTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action dated December 30, 2003, please amend the claims and consider the remarks that follow. Reconsideration and allowance of the application are respectfully requested.

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In the claims

Please replace the claims as follows:

1. (currently amended)   A method for visualizing transaction data ~~information~~ comprising the steps of:

  a) receiving transaction data ~~information~~ having a plurality of items;

  b) generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item;

  c) constructing a frequency matrix for defining a stiffness measure of a spring attached to each pair of items;

  d) relaxing the graph; wherein after relaxation the graph converges to a state of local minimal energy; wherein the distance between a pair of items represents the frequency of the items ~~set~~ in the transaction data; and

  e) employing a directed edge to represent the association confidence levels and association directions between the items in the transaction data.

2. (original)   The method of claim 1 further comprising the steps of:

  f) generating a confidence matrix for defining the confidence level of each association.

3. (original)   The method of claim 2 further comprising the steps of:

  g) receiving a user-defined minimum confidence level;

  h) displaying items having an association with a confidence level that is in a predetermined relationship with the user-defined minimum confidence level.

4. (original)   The method of claim 1 wherein the step of receiving a plurality of items comprises the steps of:

  a_1) receiving Internet transaction data; wherein the transaction data is described as follows

    Transactions $\{T1, T2, ..., Tn\}$

    Products $\{P1,....Pm\}$

    Transaction $Ti = \{P1, ... , Pmi\}$ $i = [1..n]$; and

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a_2) extracting items from the Internet transaction data.

5. (original)   The method of Claim 1 wherein the information includes a plurality of transactions, where each transaction includes one or more items; and wherein the step of generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item includes the step of
b_1) organizing the items based on how frequently the items appear in transactions; and
b_2) specifying the initial position of each item in one of a random fashion and a predetermined fashion.

6. (original)   The method of Claim 5 wherein the step of specifying the initial position of each item in one of a random fashion and a predetermined fashion includes the step of distributing the items equally on a spherical surface; wherein tightness is a sum of all supports from a current item to directly adjacent items; and wherein more tightly related items are disposed in the center of the sphere and the less tightly related items are evenly distributed around the center.

7. (original)   The method of Claim 6 wherein the step of distributing the items equally on a spherical surface includes distributing the items equally on a spherical surface by employing a Poisson Disc Sampling.

8. (original)   The method of claim 1 wherein the frequency matrix includes a plurality of elements, wherein each element includes the frequency of occurrence of the association in all transactions after normalization.

9. (original)   The method of claim 1 further comprising the step of:
transforming stiffness of the spring to a distance in a three-dimensional sphere;
wherein the distance between each pair of items represents the support therebetween.

10. (original)   The method of claim 1 wherein employing a directed edge to represent the direction of an association between two items further includes the step of:

employing color of the edge to indicate confidence level.

11. (original)   A system for use in visualizing information comprising:

a) a source of transaction data having items; and

b) a directed association mechanism coupled to the source of transaction data for receiving transaction data, mapping items and relationships between items to vertices, edges, and positions on a visual spherical surface, and for generating and displaying a self-organized graph, wherein the distance between each pair of items represents support, a directed edge represents the direction of the association, and the color of the edge is used to represent the confidence level.

12. (original)   The system of claim 11 wherein the directed association mechanism further comprises:

an initialization component for receiving items and arranging the items into an initial position on a spherical surface to generate a graph;

a relaxation component for constructing a frequency matrix that defines a stiffness measure of a spring attached to each pair of items and for relaxing the graph; wherein after relaxation the graph converges to a state of local minimal energy; and

a direction component for determining edge direction and edge color; wherein the support is the frequency of the item set in the transaction data.

13. (original)   The system of claim 12 wherein the relaxation component encapsulates a massspring engine for relaxing the graph and enabling the graph to converge to a state of local minimal energy.

14. (original)   The system of claim 12 wherein the direction component generates a confidence matrix for defining the direction and confidence level of the association rules.

15. (original)   The system of claim 11 wherein the source of transaction data is an electronic commerce web site, the items are products for sale, and the transaction data is transaction data from an electronic commerce application; and

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wherein the system is utilized to visually associate product affinities and relationships therebetween.

16. (original)   The system of claim 11 wherein the system is utilized in a market basket analysis application.

17. (original)   The system of claim 11 wherein the system is utilized in a telecommunications fraud application.

18. (original)   The system of claim 11 wherein the system is utilized in a network traffic analysis application.

19. (original)   The system of claim 11 wherein the system is utilized in a text mining application.

20. (original)   The system of claim 11 wherein the system is utilized in a user profiling application.

21. (currently amended)   An apparatus for visualizing transaction data ~~information~~ comprising:

 means for receiving transaction data ~~information~~ having a plurality of items;

 means for generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item;

 means for constructing a frequency matrix for defining a stiffness measure of a spring attached to each pair of items;

 means for relaxing the graph; wherein after relaxation the graph converges to a state of local minimal energy, wherein the distance between a pair of items represents the frequency of the items ~~set~~ in the transaction data; and

 means for employing a directed edge to represent the association confidence levels and association directions between the items in the transaction data.

22. (previously presented) The apparatus of claim 1 further comprising means for transforming stiffness of the spring to a distance in a three-dimensional sphere, wherein the distance between each pair of items represents the support therebetween.

23. (previously presented) The apparatus of claim 1 further comprising means for employing color of the edge to indicate confidence level.

24. (currently amended) An article of manufacture, comprising:

an electronically readable medium configured with instructions for causing a processor to perform the steps including,

      a) receiving transaction data ~~information~~ having a plurality of items;

      b) generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item;

      c) constructing a frequency matrix for defining a stiffness measure of a spring attached to each pair of items;

      d) relaxing the graph; wherein after relaxation the graph converges to a state of local minimal energy; wherein the distance between a pair of items represents the frequency of the items ~~set~~ in the transaction data; and

      e) employing a directed edge to represent the association confidence levels and association directions between the items in the transaction data.

25. (previously presented) The article of manufacture of claim 24 wherein the electronically readable medium is configured with further instructions for causing a processor to perform the step generating a confidence matrix for defining the confidence level of each association.

26. (previously presented) The article of manufacture of claim 25 wherein the electronically readable medium is configured with further instructions for causing a processor to perform the steps of:

      g) receiving a user-defined minimum confidence level;

h) displaying items having an association with a confidence level that is in a predetermined relationship with the user-defined minimum confidence level.

27. (previously presented)   The article of manufacture of claim 24 wherein the electronically readable medium is configured with further instructions for causing a processor, in the step of receiving a plurality of items, to perform the steps comprising:

a_1) receiving Internet transaction data; wherein the transaction data is described as follows

Transactions {T1, T2, ..., Tn}

Products {P1,....Pm}

Transaction $Ti = \{P1, ... , Pmi\}$ $i = [1..n]$; and

a_2) extracting items from the Internet transaction data.

28. (previously presented)   The article of manufacture of Claim 1 wherein the information includes a plurality of transactions, where each transaction includes one or more items; and wherein the electronically readable medium is configured with further instructions for causing a processor, in performing the step of generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item, to perform the steps comprising:

b_1) organizing the items based on how frequently the items appear in transactions; and

b_2) specifying the initial position of each item in one of a random fashion and a predetermined fashion.

29. (previously presented)   The article of manufacture of Claim 28, wherein the electronically readable medium is configured with further instructions for causing a processor, in performing the step of specifying the initial position of each item in one of a random fashion and a predetermined fashion, to perform the step of distributing the items equally on a spherical surface; wherein tightness is a sum of all supports from a current item to directly adjacent items; and wherein more tightly related items are disposed in the center of the sphere and the less tightly related items are evenly distributed around the center.

30. (previously presented)   The article of manufacture of Claim 29, wherein the electronically readable medium is configured with further instructions for causing a processor, in performing the step of distributing the items equally on a spherical surface, to perform the step of distributing the items equally on a spherical surface by employing a Poisson Disc Sampling.

31. (previously presented)   The article of manufacture of claim 24 wherein the frequency matrix includes a plurality of elements, wherein each element includes the frequency of occurrence of the association in all transactions after normalization.

32. (previously presented)   The article of manufacture of claim 24, wherein the electronically readable medium is configured with further instructions for causing a processor to perform the step comprising transforming stiffness of the spring to a distance in a three-dimensional sphere; wherein the distance between each pair of items represents the support therebetween.

33. (previously presented)   The article of manufacture of claim 24, wherein the electronically readable medium is configured with further instructions for causing a processor, in performing the step of employing a directed edge to represent the direction of an association between two items, the perform the step of employing color of the edge to indicate confidence level.

REMARKS

The rejections presented in the Office Action dated December 30, 2003 have been considered. Claims 1-33 remain pending in the application. Reconsideration and allowance of the application is respectfully requested.

An IDS accompanies this Amendment and includes pages 424-443 that describe Poisson disk sampling from the book by Glasner as requested in the Office Action.

Claims 1, 21, and 24 are amended to correct typographical errors and place the application in better position for allowance or appeal. The amendments are not made for purposes of patentability.

For the reasons explained herein and those set forth in the previous response, the Office Action fails to show that claims 1-14, 16, and 19-21, 24, and 26-33 are unpatentable under 35 USC §103(a) over the paper entitled, "Detecting Seasonal Trends and Cluster Motion Visualization for Very High Dimensional Transaction Data" by Gupta et al. ("Gupta") in view of US patent number 5,794,209 to Agrawal et al. ("Agrawal"); fails to establish that claims 15 and 17-18 are unpatentable under 35 USC §103(a) over Gupta in view of Agrawal and further in view of WIPO document number WO 01/08072 A1 by Ratnavale ("Ratnavale"); and further fails to establish that claims 1 and 11 are unpatentable under 35 USC §103(a) over Gupta in view of the paper entitled, "Evaluation of Sampling for Data Mining of Association Rules" by Zaki et al. ("Zaki").

The Final Office Action specifically addresses some of the issues raised in the previous response, and selected ones of those issues are addressed further in the following paragraphs. The arguments presented in the response to the first Office Action are maintained and incorporated herein by reference. The arguments presented in the previous response address any issues not specifically discussed herein.

One issue is whether the Office Action provides sufficient evidence of a motivation to modify Gupta with the teachings of Agrawal. It is respectfully submitted that the supplemented explanation in the current Office Action is insufficient just as the alleged motivation in the first Office Action is insufficient. The alleged reasons are insufficient because the Office Action does not demonstrate that Gupta has any need of directed edges to represent associated confidence

levels between items. Specifically, Gupta addresses seasonal trends of product purchases (Section 3). Thus, there is no apparent mechanism in Gupta that would accommodate the use of directed edges to represent associated confidence levels between items. Therefore, the alleged motivation to combine Agrawal with Gupta is still improper.

Another issue is whether Gupta suggests "generating a graph of the items by arranging the items on a spherical surface." It is respectfully submitted that the reading of these limitations as explained in the Office Action does not appear to recognize that the items are arranged on a spherical surface. The Office Action maintains that Gupta's Figure 4 shows this limitation. However, Gupta's Figure 4 does not show a sphere and instead shows a 3-D plot of data by time, similarity, and dimension values. To be clear, there is no apparent sphere in Gupta.

The current Office Action attempts to further explain the allegation that Gupta suggests the limitations of "defining a stiffness measure of a spring attached to each pair of items." It is respectfully submitted that the current explanation does not show that Gupta suggests these limitations for at least two reasons. First, Gupta does not deal with item pairs and would have no need of a stiffness measure between pairs. Second, the explanation ignores that it is the "stiffness measure of a spring" that is used, which distinguishes the claim language from the proffered elements of Gupta alleged to suggest "stiffness" by itself.

The Office Action fails to show that Agrawal suggests "generating a confidence matrix for defining the confidence level of each association" (claim 2). Specifically, the Office Action does not show any evidence of a matrix in Agrawal, even though the Office Action does show that Agrawal suggests confidence levels.

The Office Action fails to show that either Gupta or Agrawal suggests "distributing the items equally on a spherical surface by employing a Poisson Disc Sampling" (claim 7). It is respectfully submitted that the claims do not recite Poisson Disc Sampling by itself, but rather apply Poisson Disc Sampling to distributing the items on the spherical surface. As explained previously, the Office Action has not made any showing of distributing items on a spherical surface, and therefore, fails to show any suggestion of how the distribution on the spherical surface could be accomplished.
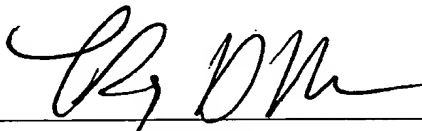
The Office Action fails to show that Zaki suggests the limitations of "employing a directed edge to represent the association confidence levels and association directions between

the items in the transaction data" (claims 1, 11). It is respectfully submitted that the Office Action appears to focus on confidence levels and disregards the limitation that directed edges are used to represent the confidence levels. To establish that the limitations are obvious, the Office Action must provide evidence that all the limitations are suggested, not just a select few.

The Office Action fails to establish a *prima facie* case of obviousness for any of the claims under any of the combinations of references. Withdrawal of the rejection and reconsideration of the claims are respectfully requested. If the examiner has any questions or concerns, a telephone call to the undersigned is welcome.

Respectfully submitted,

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Saint Paul, MN 55120
(651) 686-6633

By: _____
Name: LeRoy D. Maunu
Reg. No.: 35,274

11

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P. O. Box 272400
Fort Collins, Colorado 80527-2400

OIP

OCT 1 9 2004

PATENT APPLICATION

ATTORNEY DOCKET NO. __10003407-1__

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):   Hao et al.

Application No.: 09/847,390

Filing Date: May 2, 2001

Title: Method and System for Web-Based Visualization of Directed Association and Frequent
                 Item Sets in Large Volumes of Transaction Data

Confirmation No.: 6484

Examiner: Channavajjala

Group Art Unit: 2177

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

This Information Disclosure Statement is submitted:

( )   under 37 CFR 1.97(b), or
      (Within three months of filing national application; or date of entry of national application; or before
      mailing date of first office action on the merits; whichever occurs last)

(X)   under 37 CFR 1.97 (c) together with either a:
      ( ) Statement under 37 CFR 1.97(e), or
      (X) a $180.00 fee under 37 CFR 1.17(p), or
      (After the CFR 1.97 (b) time period, but before final action or notice of allowance, whichever occurs first)

( )   under 37 CFR 1.97 (d) together with a:
      ( ) Statement under 37 CFR 1.97(e)(1) or (2), and
      ( ) a $180.00 fee set forth in 37 CFR 1.17(p).
      (Filed after final action, a notice of allowance, on or before payment of the issue fee)

Please charge to Deposit Account 08-2025 the sum of __$180.00__ . At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account 08-2025 pursuant to 37 CFR 1.25.

(X)   Applicant(s) submit herewith Form PTO 1449 - Information Disclosure Statement together with any required copies of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

( )   A concise explanation of the relevance of foreign language patents, foreign language publications and other foreign language information listed on PTO Form 1449, as presently understood by the individuals(s) designated in 37 CFR 1.56 (c) most knowledgeable about the content is given or the attached sheet, or where a foreign language patent is cited in a search report or other action by a foreign patent office in a counterpart foreign application, an English language version of the search report or action which indicates the degree of relevance found by the foreign office is listed on form PTO 1449 and is enclosed herewith.

It is requested that the information disclosed herein be made of record in this application.

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Typed Name:Tracey M. Dotter

Signature: Tracey M. Dotter

Respectfully submitted,

Hao et al.

By _____

LeRoy D. Maunu
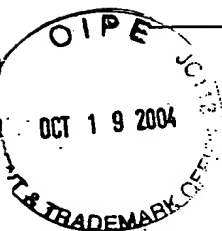Attorney/Agent for Applicant(s)
Reg. No.   35,274

Date: March 1, 2004

Telephone No.: (651) 686-6633

Rev 10/03 (IDSCERT)

FORM PTO-1449

LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S INFORMATION DISCLOSURE
STATEMENT

(Use several sheets if necessary)

ATTY. DOCKET NO. 10003407-1	APPLICATION NO. 09/847,390	CONFIRMATION NO.
APPLICANT HAO et al.		
FILING DATE May 2, 2001	GROUP 2177	

REFERENCE DESIGNATION   **U.S. PATENT DOCUMENTS**

| EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
	1A				
	1B				
	1C				
	1D				
	1E				
	1F				
	1G				
	1H				
	1I				
	1J				
	1K				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
	1L.					
	1M					
	1N					
	1O					
	1P					

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

	1Q	A.S. Glasner, "Principles of Digital Imaging Synthesis", Morgan Kaufmann Publishers, San Fransisco, 1995 pp.424-443.
	1R	
	1S	

| EXAMINER	DATE CONSIDERED
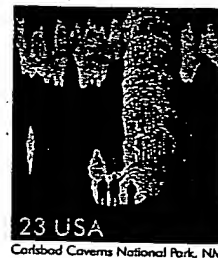
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   Applicant: HAO ET AL.
   For: METHOD AND SYSTEM FOR WEB-BASED VISUALIZATION OF
   DIRECTED ASSOCIATION AND FREQUENT ITEM SETS IN LARGE VOLUMES
   OF TRANSACTION DATA
   Docket No.: 10003407-1 (HPCO.140PA)
   Serial No.: 09/847,390
   Date of Deposit: March 1, 2004
☒   Transmittal sheet containing Certificate under 37 CFR 1.8.
☒   Office Action Response (11 pages).
☒   A Supplemental Information Disclosure Statement and Form 1449.
☒   Please charge Deposit Account No. 08-2025 (10003407-1) in the amount of $180.00 for
   the supplemental IDS.
☒   2 Return Postcards
Patent
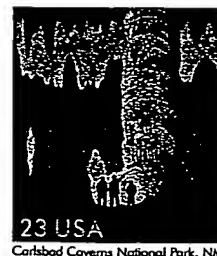
Be Henry
Hewlett-Packard Company
Legal Department – MS 110701
20555 SH 249
Houston, TX 77070

Receipt is hereby acknowledged for the following in the U.S. Patent and Trademark Office:

Applicant: HAO ET AL.

For: METHOD AND SYSTEM FOR WEB-BASED VISUALIZATION OF DIRECTED ASSOCIATION AND FREQUENT ITEM SETS IN LARGE VOLUMES OF TRANSACTION DATA

Docket No.: 10003407-1 (HPCO.140PA)

Serial No.: 09/847,390

Date of Deposit: March 1, 2004

☒ Transmittal sheet containing Certificate under 37 CFR 1.8.
☒ Office Action Response (11 pages).
☒ A Supplemental Information Disclosure Statement and Form 1449.
☒ Please charge Deposit Account No. 08-2025 (10003407-1) in the amount of $180.00 for the supplemental IDS.
☒ 2 Return Postcards

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